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TITLE	LOCAL PAL8: LPAL8.SV
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1. The first part of the report is a general introduction to the subject of the study. It includes a brief history of the subject and a statement of the purpose of the study.

2. The second part of the report is a detailed description of the methods used in the study. It includes a description of the subjects, the materials, and the procedures used.

3. The third part of the report is a presentation of the results of the study. It includes a description of the data collected and a discussion of the findings.

4. The fourth part of the report is a conclusion and a discussion of the implications of the study. It includes a summary of the findings and a discussion of the limitations of the study.

5. The fifth part of the report is a bibliography of the sources used in the study. It includes a list of the books, articles, and other sources consulted.

6. The sixth part of the report is an appendix of the data collected. It includes a list of the data and a description of the data.





LOCAL PAL8: LPAL8.SV

by

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PAL8 comes supplied with a symbol table which is unlikely to entirely satisfy most PS8 users. It would be useful to have available a version of PAL8 which does meet the needs of a particular installation, thus, avoiding the necessity of patching the symbol table for each program being assembled. Constructing a local version of PAL8, however, is not easily accomplished. The program included with this writeup makes the production of a local PAL8 extremely simple; output from the program is a file, LPAL8.SV, on SYS.

The user first prepares a FIXTAPE program containing a list of additions to or replacements for the symbol table. He then runs this program using PAL8. Immediately after running PAL8, he loads and starts the construction program. The construction program checks to make sure that the system and core are as expected and that no more than 200 (base 10) total symbols resulted from the FIXTAPE. The program then proceeds to GET a new copy of PAL8 and change the symbol table. The new local version is then SAVED by the construction program as LPAL8.SV. Finally, the program returns control to the MONITOR.

One general restriction is placed on the system configuration. An High Speed Reader must be available!

The following restrictions on the constructor program are all handled by the program itself. The program only works on PAL8 where PAL8 is available on SYS and LPAL8.SV is not available on SYS. A maximum of 223 (base 10) total symbols and pseudo-ops are allowed for the LPAL8.SV initial permanent symbol table.

OPERATION:

1. Prepare a FIXTAPE. For preparation of a FIXTAPE to append to or change the symbol table see the DEC book Programming Languages (1972) page 14-27 about altering the permanent symbol table in PAL III. The procedure to follow for PAL8 is almost identical with one exception. Append a "\$" on to the tape on the line following "PAUSE". The resulting FIXTAPE must





be on paper tape. Two short example FIXTAPES are:

EXPUNGE		CAM=7621
FIXMRI TAD=1000		BSW=7002
CLA=7200		SDLC=6774
CAM=7621	and	FIXTAB
SDLC=6774		PAUSE
FIXTAB		\$
PAUSE		
\$		

Note: PAL8 initially contains 71 symbols and 23 pseudo-ops. The maximum total symbols allowed by the constructor program is 200 to make a grand total of 223 (base 10) symbols and pseudo-ops for storage in LPAL8.

2. Run pass 1 of PAL8 with FIXTAPE and then start the LPAL8.SV CONSTRUCTOR program as follows:

- 1) After a "." from MONITOR, type R PAL8(CR) where (CR) = RETURN key
- 2) To the subsequent "\*", type PTR:(CR)
- 3) Following the first "↑", load the FIXTAPE on the HSR with the reader ON. Then type a char e.g. R
- 4) Following the second "↑", type CTRL-C to return to the MONITOR. PAL8 has now been set up for the constructor program.
- 5) When the system responds ".", type R ABSLDR(CR)
- 6) When the system responds "\*", type PTR:=12000/G\$ where \$ = ALT MODE key
- 7) When the system responds "↑", load the LPAL8.SV CONSTRUCTOR program on the HSR. Then type a char e.g. R
- 8) The constructor program should then begin by typing "HELLO!" Answer the two questions the program asks and then wait while the program completes the construction process and returns control to the MONITOR. (For a DECTape system there will be about a 50 sec pause after the user types the second Y before the program completes construction and prints further comments.)



EXAMPLE:

Shown below is the TTY printout for a FIXTAPE and LPAL8.SV CONSTRUCTOR run to construct an LPAL8. User responses shown are underlined:

.R PAL8

\*PTR:

1.1

.R ABSLDR

\*PTR:=12000/GS: \_

HELLO!

PROGRAM TO PRODUCE LOCAL PAL8 LPAL8.SV

DO YOU WANT TO RUN THIS PROGRAM(Y=YES;ANY OTHER CHAR=NO)?Y  
HAVE YOU JUST RUN A FIXTAPE(Y=YES)?Y

\*\*\*LPAL8.SV CREATED ON SYS:\*\*\*

EXIT TO MONITOR



/PROGRAM TO MAKE LOCAL PAL8

8/30/72

/DEPT OF PSYCHIATRY, UNIV OF AUCKLAND, NEW ZEALAND  
FIELD 1

\*2000

2000	6030	KCF
2001	6040	SPF
2002	4777'	JMS MESSAGE
2003	2600	HELLO /-++HELLO!-++PROGRAM TO PRODUCE LOCAL PAL8 LP
2004	4777'	JMS MESSAGE
2005	2632	HELLO2 /DO YOU WANT TO RUN THIS PROGRAM?
2006	4777'	JMS MESSAGE
2007	2664	HELLO3 /Y=YES
2010	6031	KSF
2011	5210	JMP .-1
2012	6036	KRB
2013	6046	TLS
2014	6041	TSF
2015	5214	JMP .-1
2016	1376	TAD (7447 /-""Y
2017	7640	SZA CLA
2020	5775'	JMP EXIT
2021	4777'	JMS MESSAGE
2022	2672	FIXTP /HAVE YOU JUST RUN A FIXTAPE?
2023	6031	KSF
2024	5223	JMP .-1
2025	6036	KRB
2026	6046	TLS
2027	1376	TAD (7447
2030	7650	SNA CLA
2031	5235	JMP ONWRD
2032	4777'	EXIT1, JMS MESSAGE
2033	2715	READ /PLEASE READ INSTRUCTIONS! QUITTING.
2034	5775'	JMP EXIT
2035	7301	ONWRD, CLA CLL IAC /DEVICE SYS:
2036	4774	JMS I (7700 /CALL USR
2037	0002	2
2040	2046	NAME
2041	0000	0
2042	5252	JMP ON /EXIT IF ALL OK
2043	4777'	JMS MESSAGE
2044	2746	FOUND /LPAL8.SV ALREADY EXISTS ON SYS:
2045	5232	JMP EXIT1
2046	1420	NAME, FILENA LPAL8.SV
2047	0114	
2050	7000	
2051	2326	
2052	7301	ON, CLA CLL IAC /SYS:
2053	4774	JMS I (7700 /CALL USR
2054	0002	2 /LOOKUP
2055	2064	NAMI
2056	0000	0
2057	7410	SKP /NO PAL8 ON SYS:
2060	5773'	JMP FND
2061	4777'	JMS MESSAGE
2062	2767	PAL /PAL8.SV NOT ON SYS:

2063	5232		JMP EXIT1
2064	2001	NAM1,	FILENA PAL8.SV
2065	1470		
2066	0000		
2067	2326		
2173	2200		
2174	7700		
2175	2526		
2176	7447		
2177	3104		
PAGE			
2200	7300	FND,	CLA CLL
2201	6202		6202
2202	4777		JMS I (7607 /PICK UP FIRST 2 PAGES OF PAL8 RUN
2203	0210		0210
2204	0200		0200
2205	0033		33
2206	5776'		JMP EXIT1 /ERR ON I/O. ERR EXIT
2207	1775		TAD I (256 /LOC 56 IN PAL IS SYMBOL COUNT
2210	3233		DCA COUNT
2211	1774		TAD I (377 /CHECK IF CONSTANT UNCHANGED
2212	1373		TAD (-177
2213	7650		SNA CLA
2214	5220		JMP OK
2215	4772'	PLL,	JMS MESSAGE
2216	3005		LANG /PAL8 NOT FOUND AS EXPECTED (VARIOUS FAILURES
2217	5776'		JMP EXIT1
2220	1771	OK,	TAD I (400 /CHECK TO MAKE SURE CONSTANT CHANGED IN B
2221	1370		TAD (-5602
2222	7650		SNA CLA
2223	5215		JMP PLL
2224	1233		TAD COUNT
2225	1367		TAD (-340
2226	7710		SPA CLA
2227	5234		JMP ON2
2230	4772'		JMS MESSAGE
2231	3030		LNTH /TOO MANY SYMBOLS IN TABLE TO SAVE
2232	5776'		JMP EXIT1
2233	0000	COUNT,	0
2234	1233	ON2,	TAD COUNT
2235	7106		CLL RTL /X4 TO GET NBR OF LOCS IN TABLE
2236	7041		CIA
2237	1366		TAD (7574
2240	3302		DCA TRANS /SAVE 1ST ADDR OF SYMBOL TABLE TO BE TRANS
2241	1702		TAD I TRANS
2242	1365		TAD (-5777 /MAKE SURE TABLE THERE
2243	7640		SZA CLA
2244	5215		JMP PLL
2245	6202	RETN,	6202 /SET UP MONITOR WITH TRAP
2246	4777		JMS I (7607 /READ IN MONITOR
2247	1000		1000
2250	0000		0
2251	0007		7
2252	5776'		JMP EXIT1 /I/O ERROR EXIT
2253	1364		TAD (6213



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2254 3763      DCA I (7667 /TRAP CALLS TO MONITOR
2255 1362      TAD (5671
2256 3761      DCA I (7670
2257 1301      TAD ADDR
2260 3760      DCA I (7671
2261 6201      6201
2262 1357      TAD (5610 /GET CHARAC FROM MY PROGRAM!
2263 3756      DCA I (1207
2264 1364      TAD (6213
2265 3755      DCA I (1206
2266 1300      TAD TRAP
2267 3754      DCA I (1210
2270 1353      TAD (7000
2271 3752      DCA I (1211
2272 1353      TAD (7000
2273 3751      DCA I (357 /REMOVE TLS PRINT FROM MONITOR
2274 1350      TAD (7410
2275 3747      DCA I (355
2276 6203      6203
2277 5771      JMP I (400 /START MONITOR SUBROUTINE
2300 2306      TRAP,  LIST
2301 2245      ADDR,  RETN
2302 0000      TRANS, 0
2303 2452      X,     GELIST
2304 2467      Y,     SALIST
2305 7777      SWICH, -1
2306 7300      LIST,  CLA CLL
2307 1703      TAD I X /GE SYS:PAL8 FIRST TIME THEN SA SYS:LPAL8 S0
2310 7450      SNA
2311 5315      JMP OUT
2312 2303      ISZ X
2313 6203      6203
2314 5752      JMP I (1211 /RETURN WITH CHAR TO MONITOR
2315 2305      OUT,   ISZ SWICH
2316 5746'     JMP DUN /FINISHED WITH SAVE SYS:LPAL8
2317 6202      6202
2320 4777      JMS I (7607 /PICK UP 1ST 2 PAGES OF NEW COPY OF PAL8
2321 0210      0210
2322 0200      0200
2323 0033      33
2324 5776'     JMP EXIT1 /I/O ERR EXIT
2325 1775      TAD I (256 /GET SYMBOL TABLE COUNT
2326 1345      TAD (-136 /CORRECT ORIGINAL VALUE?
2327 7640      SZA CLA
2330 5215      JMP PLL
2331 1233      TAD COUNT
2332 3775      DCA I (256 /SET NEW COUNT
2333 6202      6202
2334 4777      JMS I (7607 /STORE BACK THE TWO PAGES AS CHANGED
2335 4210      4210
2336 0200      0200
2337 0033      33
2340 5776'     JMP EXIT1 /I/O ERR EXIT
2341 1302      TAD TRANS
2342 5744'     JMP XX

```



2344 2400  
 2345 7642  
 2346 2524  
 2347 0355  
 2350 7410  
 2351 0357  
 2352 1211  
 2353 7000  
 2354 1210  
 2355 1206  
 2356 1207  
 2357 5610  
 2360 7671  
 2361 7670  
 2362 5671  
 2363 7667  
 2364 6213  
 2365 2001  
 2366 7574  
 2367 7440  
 2370 2176  
 2371 0400  
 2372 3104  
 2373 7601  
 2374 0377  
 2375 0256  
 2376 2032  
 2377 7607

2400	3217	XX,	PAGE
2401	1777		DCA T1
2402	1376		TAD TRANS
2403	3220		TAD (200
2404	7300	BACK,	DCA T2
2405	6213		CLA CLL /MOVE TABLE OVER TO FIELD 0
2406	1617		6213
2407	6201		TAD I T1
2410	3621		6201
2411	2217		DCA I C5600
2412	2221		ISZ T1
2413	2220		ISZ C5600
2414	5204		ISZ T2
2415	6213		JMP BACK
2416	5222		6213
2417	0000	T1,	JMP NWRD
2420	0000	T2,	0
2421	5600	C5600,	0
2422	6202	NWRD,	5600
2423	4775		6202
2424	0210		JMS I (7607 /PICK UP TRANSFER LOCS
2425	0200		0210
2426	0036		0200
2427	5774		36
2430	1773		JMP EXIT1
2431	1372		TAD I (537 /LOC FOR SYMB TABLE IN FLD 1
			TAD (-7004 /CHECK ORIG VALUE

2432	7640	SZA CLA
2433	5771'	JMP PLL
2434	1777'	TAD TRANS
2435	3773	DCA I (537
2436	1777'	TAD TRANS
2437	1376	TAD (200 /STORE UP TO TOP PAGE!
2440	3770	DCA I (540
2441	6202	6202
2442	4775	JMS I (7607
2443	4210	4210 /SAVE CHANGED VALUES IN PAL8 LOCAL VERSION
2444	0200	0200
2445	0036	36
2446	5774'	JMP EXIT1
2447	1767'	TAD Y
2450	3766'	DCA X
2451	5765'	JMP RETN /GO SAVE LOCAL PAL8 LPAL8.SV
2452	0307	GELIST, "G
2453	0305	"E
2454	0240	240
2455	0323	"S
2456	0331	"Y
2457	0323	"S
2460	0272	":
2461	0320	"P
2462	0301	"A
2463	0314	"L
2464	0270	"8
2465	0215	215
2466	0000	0
2467	0323	SALIST, "S
2470	0301	"A
2471	0240	240
2472	0323	"S
2473	0331	"Y
2474	0323	"S
2475	0272	":
2476	0314	"L
2477	0320	"P
2500	0301	"A
2501	0314	"L
2502	0270	"8
2503	0256	".
2504	0323	"S
2505	0326	"V
2506	0240	240
2507	0260	"0
2510	0260	"0
2511	0260	"0
2512	0260	"0
2513	0260	"0
2514	0255	"-
2515	0260	"0
2516	0267	"7
2517	0263	"3
2520	0267	"7



2521	0267	"7
2522	0215	215
2523	0000	0
2524	4764	DUN, JMS MESSAGE
2525	3047	FINISH /LPAL8.SV CREATED ON SYS:
2526	4764	EXIT, JMS MESSAGE
2527	3071	LAST /EXIT TO MONITOR.
2530	6213	6213
2531	1363	TAD (6202
2532	3762	DCA I (7667
2533	1361	TAD (4207
2534	3760	DCA I (7670
2535	1357	TAD (1000
2536	3756	DCA I (7671
2537	5762	JMP I (7667 /EXIT TO MONITOR
2556	7671	
2557	1000	
2560	7670	
2561	4207	
2562	7667	
2563	6202	
2564	3104	
2565	2245	
2566	2303	
2567	2304	
2570	0540	
2571	2215	
2572	0774	
2573	0537	
2574	2032	
2575	7607	
2576	0200	
2577	2302	

PAGE

2600	3736	HELLO, TEXT /-++HELLO!-++PROGRAM TO PRODUCE LOCAL PAL8 LPA
2601	3610	
2602	0514	
2603	1417	
2604	4137	
2605	3636	
2606	2022	
2607	1707	
2610	2201	
2611	1540	
2612	2417	
2613	4020	
2614	2217	
2615	0425	
2616	0305	
2617	4014	
2620	1703	
2621	0114	
2622	4020	
2623	0114	
2624	7040	

2625	1420	
2626	0114	
2627	7056	
2630	2326	
2631	0000	
2632	3736	HELLO2, TEXT /-+DO YOU WANT TO RUN THIS PROGRAM(Y=YES;ANY
2633	3604	
2634	1740	
2635	3117	
2636	2540	
2637	2701	
2640	1624	
2641	4024	
2642	1740	
2643	2225	
2644	1640	
2645	2410	
2646	1123	
2647	4020	
2650	2217	
2651	0722	
2652	0115	
2653	5031	
2654	7531	
2655	0523	
2656	7301	
2657	1631	
2660	4017	
2661	2410	
2662	0522	
2663	0000	
2664	4003	HELLO3, TEXT / CHAR=NO)?/
2665	1001	
2666	2275	
2667	1617	
2670	5177	
2671	0000	
2672	3736	FIXTP, TEXT /-+HAVE YOU JUST RUN A FIXTAPE(Y=YES)?/
2673	1001	
2674	2605	
2675	4031	
2676	1725	
2677	4012	
2700	2523	
2701	2440	
2702	2225	
2703	1640	
2704	0140	
2705	0611	
2706	3024	
2707	0120	
2710	0550	
2711	3175	
2712	3105	
2713	2351	



2714	7700	
2715	3736	READ, TEXT /-!***PLEASE READ INSTRUCTIONS AGAIN!***!QUIT!
2716	5252	
2717	2014	
2720	0501	
2721	2305	
2722	4022	
2723	0501	
2724	0440	
2725	1116	
2726	2324	
2727	2225	
2730	0324	
2731	1117	
2732	1623	
2733	4001	
2734	0701	
2735	1116	
2736	4152	
2737	5237	
2740	3636	
2741	2125	
2742	1124	
2743	2411	
2744	1607	
2745	5600	
2746	3736	FOUND, TEXT /-!LPAL8.SV ALREADY EXISTS ON SYS:/
2747	1420	
2750	0114	
2751	7056	
2752	2326	
2753	4001	
2754	1422	
2755	0501	
2756	0431	
2757	4005	
2760	3011	
2761	2324	
2762	2340	
2763	1716	
2764	4023	
2765	3123	
2766	7200	
2767	3736	PAL, TEXT /-!PAL8.SV NOT FOUND ON SYS:/
2770	2001	
2771	1470	
2772	5623	
2773	2640	
2774	1617	
2775	2440	
2776	0617	
2777	2516	
3000	0440	
3001	1716	
3002	4023	

3003	3123	
3004	7200	
3005	3736	LANG, TEXT /-+PAL8 NOT FOUND IN CORE AS EXPECTED./
3006	2001	
3007	1470	
3010	4016	
3011	1724	
3012	4006	
3013	1725	
3014	1604	
3015	4011	
3016	1640	
3017	0317	
3020	2205	
3021	4001	
3022	2340	
3023	0530	
3024	2005	
3025	0324	
3026	0504	
3027	5600	
3030	3736	LNTH, TEXT /-+TOO MANY SYMBOLS IN TABLE./
3031	2417	
3032	1740	
3033	1501	
3034	1631	
3035	4023	
3036	3115	
3037	0217	
3040	1423	
3041	4011	
3042	1640	
3043	2401	
3044	0214	
3045	0556	
3046	0000	
3047	3736	FINISH, TEXT /-+***LPAL8.SV CREATED ON SYS:***/
3050	3636	
3051	5252	
3052	5214	
3053	2001	
3054	1470	
3055	5623	
3056	2640	
3057	0322	
3060	0501	
3061	2405	
3062	0440	
3063	1716	
3064	4023	
3065	3123	
3066	7252	
3067	5252	
3070	0000	
3071	3736	LAST, TEXT /-+EXIT TO MONITOR-+//



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3072 3605
3073 3011
3074 2440
3075 2417
3076 4015
3077 1716
3100 1124
3101 1722
3102 3736
3103 0000
3104 0000 MESSAGE, 0 /MESSAGE PRINTING SUBROUTINE
3105 7300 CLA CLL
3106 1704 TAD I MESSAGE
3107 3325 DCA TMP
3110 2304 ISZ MESSAGE
3111 1725 NXXT, TAD I TMP
3112 0377 AND (7700
3113 7012 RTR
3114 7012 RTR
3115 7012 RTR
3116 4326 JMS TYP2
3117 1725 TAD I TMP
3120 0323 AND K77
3121 4326 JMS TYP2
3122 2325 ISZ TMP
3123 0077 K77, 77
3124 5311 JMP NXXT
3125 0000 TMP, 0
3126 0000 TYP2, 0 /SET UP ASCII CODE AND HANDLE - AND +
3127 7450 SNA
3130 5347 JMP EX2 /EXIT IF 6 BITS OF 0 FOUND FOR CHAR
3131 1376 TAD (-40 /LETTER OR OTHER CHAR?
3132 7510 SPA
3133 1375 TAD (100 /LETTER
3134 1374 TAD (240 /OTHER
3135 1373 TAD (-336 /- OR +?
3136 7510 SPA
3137 5344 JMP .+5 /NOPE
3140 7440 SZA /YEP
3141 1372 TAD (2 /CODE 215 = RETURN
3142 1371 TAD (212 /CODE 212 = LINE FEED
3143 7410 SKP /DON'T WANT TO CHANGE CODE IN AC
3144 1370 TAD (336 /GET THE CHAR CODE BACK
3145 4351 JMS TYPE /PRINT
3146 5726 JMP I TYP2
3147 6030 EX2, KCF
3150 5704 JMP I MESSAGE /EXIT FROM ROUTINE
3151 0000 TYPE, 0 /ROUTINE TO TYPE ONE CHAR
3152 6046 TLS
3153 6041 TSF
3154 5353 JMP .-1
3155 7200 CLA
3156 5751 JMP I TYPE
3170 0336
3171 0212

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3172 0002  
3173 7442  
3174 0240  
3175 0100  
3176 7740  
3177 7700

S

ADDR	2301	BACK	2404	COUNT	2233	C5600	2421	DUN	2524
EXIT	2526	EXIT1	2032	EX2	3147	FINISH	3047	FIXTP	2672
FND	2200	FOUND	2746	GELIST	2452	HELLO	2600	HELLO2	2632
HELLO3	2664	K77	3123	LANG	3005	LAST	3071	LIST	2306
LNTH	3030	MESSAGE	3104	NAME	2046	NAM1	2064	NWRD	2422
NXXT	3111	OK	2220	ON	2052	ONWRD	2035	ON2	2234
OUT	2315	PAL	2767	PLL	2215	READ	2715	RETN	2245
SALIST	2467	SWICH	2305	TMP	3125	TRANS	2302	TRAP	2300
TYPE	3151	TYP2	3126	T1	2417	T2	2420	X	2303
XX	2400	Y	2304						